

Claims

- [c1] 1. An apparatus for fluid treatment of a borehole, the apparatus comprising a tubing string having a long axis and a wall defining an inner bore, a plurality of closures accessible from the inner bore of the tubing string, each closure closing a port extending through the wall of the tubing string and preventing fluid flow through its port, but being openable to permit fluid flow through its port and each closure openable independently from each other closure and a port-opening sleeve positioned in the tubing string and driveable through the tubing string to actuate the plurality of closures to open the ports.
- [c2] 2. The apparatus of claim 1 wherein at least one of the plurality of closures includes a cap extending into the tubing string inner bore, the cap being openable by movement therepast of the port-opening sleeve.
- [c3] 3. The apparatus of claim 2 wherein the cap is opened by engagement thereagainst by the port-opening sleeve has engaged against and opened the cap.
- [c4] 4. The apparatus of claim 3 wherein cap is shearable by the port-opening sleeve.

- [c5] 5.The apparatus of claim 1 wherein at least one of the plurality of closures includes a port-closure sleeve covering its port, the port-closure sleeve being moveable to expose its port by engagement of port-opening sleeve to move the port-closure sleeve along the tubing string.
- [c6] 6.The apparatus of claim 5 wherein the port-closure sleeve includes a profile and the port-opening sleeve includes a locking dog biased outwardly therefrom and selected to lock into the profile on the port-closure sleeve.
- [c7] 7.The apparatus of claim 1 wherein the port opening sleeve is driveable by plugging the sleeve with a sealing device and applying fluid pressure to move the sleeve.
- [c8] 8.The apparatus of claim 7 wherein the sealing device can seal against fluid passage past the port-opening sleeve.
- [c9] 9.The apparatus of claim 7 wherein the port-opening sleeve has formed thereon a seat and the sealing device is a plug.
- [c10] 10.The apparatus of claim 7 wherein the port-opening sleeve has formed thereon a seat and the sealing device is a ball selected to seal against the seat.
- [c11] 11.The apparatus of claim 7 further comprising a second

port-opening sleeve for opening a second plurality of closures.

[c12] 12.The apparatus of claim 1 further comprising a packer disposed about the tubing string.

[c13] 13.The apparatus of claim 12 wherein the packer is a solid body packer including multiple packing elements.

[c14] 14.The apparatus of claim 13 wherein the multiple packing elements are spaced apart.

[c15] 15.A method for fluid treatment of a borehole, the method comprising: providing an apparatus for wellbore treatment including a tubing string having a long axis and a wall defining an inner bore, a plurality of closures accessible from the inner bore of the tubing string, each closure closing a port extending through the wall of the tubing string and preventing fluid flow through its port, but being openable to permit fluid flow through its port and each closure openable independently from each other closure and a port-opening sleeve positioned in the tubing string and driveable through the tubing string to actuate the plurality of closures to open the ports, running the tubing string into a wellbore to a position for treating the wellbore; moving the port-opening sleeve to open the closures of the ports and continuing

fluid flow to force wellbore treatment fluid out through the ports.

[c16] 16.The method of claim 15, further comprising circulating the wellbore treatment fluid to surface.

[c17] 17.The method of claim 15, further comprising isolating the wellbore treatment fluid to zone in the wellbore.

[c18] 18.The method of claim 15 wherein the step of moving the sleeve is conducted remotely.

[c19] 19.The method of claim 18 wherein the sleeve includes a seat and the step of moving the sleeve includes deploying a sealing device to plug against the seat to create a pressure differential to drive the sleeve along the tubing string.

[c20] 20.The method of claim 15 wherein the step of moving the port-opening sleeve to open the closures of the ports includes shearing caps from the ports.

[c21] 21.The method of claim 15 wherein the step of moving the port-opening sleeve to open the closures of the ports includes moving port-closure sleeves from over the ports.